

**SELF-ASSEMBLING CELL AGGREGATES AND
METHODS OF MAKING ENGINEERED TISSUE USING THE SAME**

ABSTRACT OF THE INVENTION

A composition comprising a plurality of cell aggregates for use in the production of engineered organotypic tissue by organ printing. A method of making a plurality of cell aggregates comprises centrifuging a cell suspension to form a pellet, extruding the pellet through an orifice, and cutting the extruded pellet into pieces. Apparatus for making cell aggregates comprises an extrusion system and a cutting system. In a method of organ printing, a plurality of cell aggregates are embedded in a polymeric or gel matrix and allowed to fuse to form a desired three-dimensional tissue structure. An intermediate product comprises at least one layer of matrix and a plurality of cell aggregates embedded therein in a predetermined pattern. Modeling methods predict the structural evolution of fusing cell aggregates for combinations of cell type, matrix, and embedding patterns to enable selection of organ printing processes parameters for use in producing an engineered tissue having a desired three-dimensional structure.